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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Jinlian Hu

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EXAMINER

SERGEANT, RABON A

ART UNIT

PAPER NUMBER

1796

NOTIFICATION DATE

DELIVERY MODE

09/21/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/715,552	<b>Applicant(s)</b> HU ET AL.	
	<b>Examiner</b> Rabon Sergent	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3,9-12,16-20 and 23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,9-12,16-20 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

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1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 27, 2009 has been entered.

2. Claims 10 and 18-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Within page 3 of the specification and claims 10 and 18, applicants have stated that the molar ratio of difunctional isocyanate to polycaprolactone diol is from about 1:1.5 to about 1:5.0; however, such a ratio will not yield an isocyanate terminated prepolymer, because the recited ratio mandates an excess of hydroxyl groups. However, according to applicants' disclosure, an isocyanate terminated prepolymer is contemplated, since the recited chain extenders are reactive with isocyanate groups. Furthermore, within the last two lines of page 5 of the specification, applicants disclose a  $[NCO]/[OH]$  molar ratio of about 1.5 to 5.0 in the formation of a prepolymer. This recited ratio range is the reverse the ratio cited within page 3 and claimed within claims 10 and 18. Clarification is required. The examiner has examined the application with respect to the ratio cited within page 5 of the specification, as it appears that this is the only ratio range that is suitable for arriving at applicants' invention.

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3. Claims 10 and 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As aforementioned within paragraph 2, claims 10 and 18-20 specify ratio ranges of isocyanate to diol that cannot yield isocyanate terminated prepolymers. Since the production of such prepolymers appears to be paramount to applicants' invention, the claimed ranges render the claims indefinite.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claims 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Hoefer et al. ('865).

Hoefer et al. disclose aqueous polyurethane coating dispersions produced from polyisocyanates, polycaprolactone diols, and chain extenders that meet those of applicants, and further disclose that the dispersions may be produced from known processes, including a two pot polyurethane process. See abstract; column 2, lines 35+; column 3, lines 1-36; column 4; and column 5, lines 8-50. Applicants have not established that the claimed process steps yield a product that is patentably distinct from the dispersions of Hoefer et al. Given that the instant polyurethane and the disclosed polyurethanes are produced from the same reactants, the position is taken that the polyurethanes of the reference inherently possess the claimed properties.

6. Claims 1-3, 9-12, 16-20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanathan et al. ('213) in view of Hoefer et al. ('865).

Ramanathan et al. disclose the production of polyurethane aqueous dispersions, wherein a prepolymer is produced in the presence of solvent from diisocyanates, polyol, and chain extenders, wherein the diisocyanates and chain extender correspond to applicants' claimed components and the polyol may be a linear polyester diol. After formation of the prepolymer, the acid groups resulting from incorporation of the chain extender are neutralized with an amine, such as triethylamine. The neutralized prepolymer is then dispersed in water and the solvent is removed. This disclosure satisfies applicants' steps d) through f). Furthermore, applicants' claimed ratios and reaction conditions are disclosed within the reference. See column 2, lines 45+, especially line 59, and columns 3-5. Patentees teach at column 5, lines 14-16 that the diisocyanate, polyol, and chain extender may be reacted sequentially to form block copolymers;

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therefore, patentees are considered to adequately disclose applicants' steps a) through c). Since sequential reaction is disclosed and since heating is clearly disclosed to promote such reaction, the position is taken that the step of heating the reactants, corresponding to applicants' step b), is clearly encompassed by the disclosure. Furthermore, given the disclosure of the time frame for reaction set forth within lines 54 and 55 of column 2 and the disclosure pertaining to sequential reaction, the position is taken that applicants' claimed time frames are encompassed by the disclosure of the reference. The skilled artisan would immediately recognize that the disclosed time frames are applicable to the disclosed sequential reaction.

7. Though Ramanathan et al. disclose that linear polyester diols may be used and further disclose the sequential reaction of such reactants, patentees fail to disclose a reaction system wherein polycaprolactone diol is used as the sole polyol to produce the initial polyol and polyisocyanate reaction mixture. Still, the exclusive use of polycaprolactone diols as the high molecular weight polyol component to produce aqueous polyurethane coating compositions was known at the time of invention. This position is supported by the teachings of Hoefer et al. See abstract; column 2, lines 35+; column 3, lines 1-36; column 4; and column 5, lines 8-50.

Therefore, the position is taken in view of the disclosed suitability of using linear polyester diols within Ramanathan et al. and the disclosed use of polycaprolactone diols to produce aqueous polyurethane dispersions within Hoefer et al., analogous to those of Ramanathan et al., that it would have been obvious to use polycaprolactone diols as the linear polyester diol of Ramanathan et al., so as to arrive at the instant invention.

8. Claims 1-3, 9-12, 16-20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoefer et al. ('865) in view of Ramanathan et al. ('213).

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Hoefer et al. disclose aqueous polyurethane coating dispersions produced from polyisocyanates, polycaprolactone diols, and chain extenders that meet those of applicants, and further disclose that the dispersions may be produced from known processes, including a two pot polyurethane process. See abstract; column 2, lines 35+; column 3, lines 1-36; column 4; and column 5, lines 8-50.

9. Though Hoefer et al. fail to disclose a sequence of steps in the manufacture of their dispersions that precisely corresponds to those of applicants, the position is taken that such a sequence was known at the time of invention to be useful in the production of polyurethane dispersions, fully analogous to those of Hoefer et al. This position is supported by the teachings of Ramanathan et al. Ramanathan et al. disclose the production of polyurethane aqueous dispersions, wherein a prepolymer is produced in the presence of solvent from diisocyanates, polyol, and chain extenders, wherein the diisocyanates and chain extender correspond to applicants' claimed components and the polyol may be a linear polyester diol. After formation of the prepolymer, the acid groups resulting from incorporation of the chain extender are neutralized with an amine, such as triethylamine. The neutralized prepolymer is then dispersed in water and the solvent is removed. This disclosure satisfies applicants' steps d) through f). Furthermore, applicants' claimed ratios and reaction conditions are disclosed within the reference. See column 2, lines 45+, especially line 59, and columns 3-5. Patentees teach at column 5, lines 14-16 that the diisocyanate, polyol, and chain extender may be reacted sequentially to form block copolymers; therefore, patentees are considered to adequately disclose applicants' steps a) through c). Since sequential reaction is disclosed and since heating is clearly disclosed to promote such reaction, the position is taken that the step of heating the reactants,

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corresponding to applicants' step b), is clearly encompassed by the disclosure. Furthermore, given the disclosure of the time frame for reaction set forth within lines 54 and 55 of column 2 and the disclosure pertaining to sequential reaction, the position is taken that applicants' claimed time frames are encompassed by the disclosure of the reference. The skilled artisan would immediately recognize that the disclosed time frames are applicable to the disclosed sequential reaction. Accordingly, in view of Hoefer et al.'s disclosure that known processes may be used to produce their dispersions, the position is taken that it would have been obvious to employ the process of the secondary reference, so as to arrive at the instant invention.

10. Applicants' response has been fully considered; however, they are moot in view of the new grounds of rejection.

Any inquiry concerning this communication should be directed to R. Sergent at telephone number (571) 272-1079.

/Rabon Sergent/  
Primary Examiner, Art Unit 1796

September 14, 2009